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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/821,636
Filing Date: March 29, 2001
Appellant(s): IKEDA, HIROYUKI

Robert J. Depke
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09/01/2006 appealing from the Office action mailed 11/02/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,808,595	**Kubota et al.**	**9-1998**

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 39-41 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kubota et al. (US 5,808,595).

Kubota et al. discloses a display apparatus comprising a plurality of thin film transistors, each of the thin film transistors (Fig. 1a) comprising a semiconductor thin film (12) constituting a channel (12a) and having a threshold voltage, and a first gate electrode (16) on one side the semiconductor thin film (12) and a second gate electrode (a conductive electrode 14) on an opposite side of the semiconductor thin film (12), and further comprising a means (said means comprising a second gate electrode 14 and an attached signal line for applying a voltage to the second gate electrode as shown in Figures 1a and 4) for adjusting the threshold voltage by applying a first threshold adjustment voltage (no bias voltage) to the second gate electrode (the conductive electrode 14) when the first gate electrode receives a first control voltage and applying a second threshold adjustment voltage (bias voltage of -20V) to the second gate electrode (14) when the first electrode receives a second control voltage (see col. 13, lines 27-37 and Fig. 4).,

Regarding claim 2, Kubota et al. further discloses the semiconductor thin film (12) constituting the channel (12a) made of polycrystalline silicon (col. 12, lines 25-27)

and has a thickness 100nm (col. 13, lines 20-21). Kubota et al. further discloses some of the thin film transistors being p-channel transistors. It is a known fact that for p-channel transistors, the channel (12a) is doped of n-type impurity which is either phosphorus or arsenic. Therefore, the channel does not contain boron which is a p-type impurity that effectively affects the formation of a depletion layer.

Regarding claim 3, Kubota et al. further disclose n-channel transistors being turned into those of depletion type wherein the film thickness of the semiconductor thin film (12) is set to not more than two times the maximum thickness of the depletion layer (col. 13, lines 14-18). It is a known fact that for n-channel transistors, the channel (12a) is doped of p-type impurity which is boron. Therefore, it is inherent that the semiconductor thin film (12) of the n-channel transistors contains an impurity effectively affecting the formation of a depletion layer.

Regarding claims 40 and 41, Kubota et al. clearly teaches the voltage Vgs applied to the first gate electrode 16 (any voltage from –4V to 8 V) being different from the threshold adjustment voltage (-20V as a solid line shown in Fig. 4) applied to the second gate electrode 14 during voltage application (see Fig. 4 and col. 13, lines 27-37).

(10) Response to Argument

A. Anticipation rejection under 102(b).

With respect to claims 1 and 39, Appellant states that the prior art reference cited by the examiner fails to teach the application of two different threshold adjustment voltages to a second gate electrode 14 based upon the respective application of a first

control voltage or a second control voltage to the first gate electrode of the transistor. The examiner respectfully disagrees with the remark because the Kubota reference clearly teaches the same structure having the same means to perform the function as claimed (see the rejection as described above). Indeed, appellant admits in the Appeal brief (page 9, third paragraph) that the Kubota reference does suggest the threshold voltage adjustment applied to the second gate can be varied in order to adjust the threshold voltage of a control gate by applying a first threshold voltage (no bias voltage) to the second gate electrode (14) when the first gate electrode (16) receives a first control voltage (Vgs approximately 3V on the abscissa of Fig. 4) and applying a second threshold adjustment voltage (bias voltage of –20V) to the second gate electrode (14) when the first gate electrode (16) receives a second control voltage (Vgs approximately 6V on the abscissa of Fig. 4) to adjust the threshold voltage by 2.5 V.

Appellant further argues that the Kubota reference fails to show certain features of the present invention, it is noted that the features upon which applicant relies (i.e., during circuit operation and based upon what voltage is applied to the control gate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner finds that there is nothing in the claims 1 and 39 requiring the two different adjustment threshold voltages to be applied during circuit operation and the terms "first control voltage" and "second control voltage" to be different from each other and limited to any particular voltage. Thus, any voltage of the Vgs (i.e., approximately 3V and approximately 6V) on

the horizontal axis (the abscissa) of Figure 4 would read on the first control voltage and the second control voltage applied to the first gate electrode(16).

Appellant further agues that the Kubota reference teaches away from varying the threshold adjustment voltage applied to the second gate (14) by citing col. 12, lines 30-31, which states that the voltage applied to the second gate electrode (14) is constant. Appellant then speculates that the threshold adjustment voltage to the second gate electrode does not change and consequently the value never changes during circuit operation. Appellant errs in his remark because the term "constant voltage" does not mean "fixed voltage" or "permanent voltage" and the claims does not exclude "a constant voltage". Indeed, a constant voltage applied to the second gate electrode can be changed as appellant clearly admits in the Appeal brief (page 9, third paragraph) that the Kubota reference does suggest the threshold voltage adjustment applied to the second gate can be varied in order to adjust the threshold voltage of a control gate (see col. 13, lines 27-37). Appellant also states that Figure 4 shows one threshold adjustment voltage being applied throughout the entire range of control voltage application which is not true because the examiner finds that there is nothing in the Kubota reference including Figure 4 that literally teaches the application of one constant threshold adjustment voltage during the entire range of control voltage application. In fact, the Kubota reference (see Fig. 4, col. 13, lines 27-37 and col. 16, lines 11-13 and lines 22-26) discloses applying different constant threshold adjustment voltages (a broken line for no bias voltage and a solid line for –20 V bias voltage) to the second gate 14 during the entire range of control voltage application (see col. 16, lines 11-13,

lines 22-26). In fact, Figure 4 is more or less discloses the same operation that the present invention discloses in Fig. 3A. Appellant is requested to explain why Fig. 3A of the present invention would be different from the Fig. 4 of the prior art reference. In conclusion, absence of evidence to the contrary, Fig. 4 has not shown or suggested only one threshold adjustment voltage can be applied throughout the entire range of control voltage application as alleged by appellant; and the threshold adjustment voltage can be changed as it is true with Fig. 3A of the present invention than it is also true with Fig. 4 of the Kubota reference. It is noted that the limitations "during circuit operation" and "the entire range of control voltage application" are not in the claims. Also, these limitations are taken to be functional statements that cannot serve to distinguish a claim, which is not a process claim, from a reference since it does not define any structure. This is particularly so where the functional statement is conditional in nature, as to a possibility that may or may not occur. In re Mason, 244 F.2d 733, 114 USPQ 127 (CCPA 1957).

It is noted that the claim limitations "for adjusting the threshold voltage by applying a first threshold adjustment voltage to the second gate electrode when the first gate electrode receives a first control voltage and applying a second threshold adjustment voltage different than the first threshold adjustment voltage to the second gate electrode when the first electrode receives a second control voltage" in claim 1 and claim 39 are functional languages and are nonlimiting since it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims

cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Kubota et al. has the claimed structure having the means as claimed; therefore, Kubota et al. is capable of performing the function as claimed. Furthermore, a functional statement cannot serve to distinguish a claim, which is not a process claim, from a reference since it does not define any structure. This is particularly so where the functional statement is conditional in nature, as to a possibility that may or may not occur. In re Mason, 244 F.2d 733, 114 USPQ 127 (CCPA 1957). Again, it is noted that the Kubota reference as described above clearly discloses the claimed function (see col. 13, lines 27-37).

With respect to dependent claims 2-3 and 40-41, appellant asserts that these claims include all the limitations of the base claim; therefore, these claims are not anticipated by the Kubota reference. The examiner respectfully disagrees with the remark because it is clear as discussed above that the base claim and all the limitations in the dependent claims are taught by the Kubota reference. Thus, dependent claims 2-3 and 40-41 are anticipated by the Kubota reference.

With respect to claims 40 and 41. Appellant further states that the examiner has failed to identify a prior art reference which teaches that the voltages applied to the first and second gate electrodes are different. It is clear that Kubota et al. teaches the

voltage Vgs applied to the first gate electrode 16 (any voltage from –4V to 8 V) being different from the threshold adjustment voltage (-20V as a solid line shown in Fig. 4) applied to the second gate electrode 14 during voltage application (see Fig. 4 and col. 13, lines 27-37).

B. Rejection under 103(a).

The prior art disclosure that anticipates claims 1-3 and 39-41 under 35 USC 102 also renders the claims obvious under 35 USC 103(a), for anticipation is the epitome of obviousness. Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983) (citing In re Fracalossi, 681 F.2d 792, 215 USPQ 569 (CCPA 1982)).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

tt

November 16, 2006

Thien Tran

THIEN TRAN
PRIMARY EXAMINER

Conferees:

Thien Tran TT

Richard Elms

Darren Schuberg